MatrixPRO-II

DVI 16x16 Matrix Router

User's Guide

Visibly yours

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Operators Safety Summary

The general safety information in this summary is for operating personnel.

Do not remove panels or covers

There are no user-serviceable parts within the unit. Removal of the top cover will expose dangerous voltages. To avoid personal injury, do not remove the top cover. Do not operate the unit without the cover installed.

Power Source

This product is intended to operate from a power source that will not apply more than 230 volts rms between the supply conductors or between both supply conductor and ground. A protective ground connection by way of grounding conductor in the power cord is essential for safe operation.

Grounding the Product

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Use of the Power Cord

Use only the power cord and connector specified for your product. Use only a power cord that is in good condition. Refer cord and connector changes to qualified service personnel.

Use of the Proper Fuse

To avoid fire hazard, use only the fuse having identical type, voltage rating, and current rating characteristics. Refer fuse replacement to qualified service personnel.

Do not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere.

Terms in This Manual and Equipment Marking

Warning

Highlights an operating procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury to or death of personnel.

Caution

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

AVETISSEMENT!

Le point d´exclamation dans un triangle equilatéral signale à alerter l´utilisateur qu´il y a des instructions d´operation et d´entretien tres importantes dans la litérature qui accompagne l´appareil.

VORSICHT

Ein Ausrufungszeichen innerhalb eines gleichwinkeligen Dreiecks dient dazu, den Benutzer auf wichtige Bedienungs-und Wartungsanweisungen in der Dem Great beiliegenden Literatur aufmerksam zu machen.

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This symbol on the product indicates that, under the European Directive 2002/96/EC governing waste from electrical and electronic equipment, this product must not be disposed of with other municipal waste. Please dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.
For more information about recycling of this product, please contact your local city office or your municipal waste disposal service. For details, please visit the Barco website at:
http://www.barco.com/en/AboutBarco/weee

Turkey RoHS Compliance

Türkiye Cumhuriyeti: EEE Yönetmeliğine Uygundur
Republic of Turkey: In conformity with the EEE Regulation

中国大陆 RoHS
Chinese Mainland RoHS

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零件项目(名称) Component Name	有毒有害物质或元素 Hazardous Substances or Elements					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印制电路配件 Printed Circuit Assemblies	O	O	O	O	O	O
插入式印制电路配件 Plug in Printed Circuit Assembly	O	O	O	O	O	O
外接电(线)缆 External Cables	O	O	O	O	O	O
底架 Chassis	O	O	O	O	O	O
电源供应器 Power Supply Unit	O	O	O	O	O	O
内部线路 Internal wiring	O	O	O	O	O	O
显示（ ） Display	O	O	O	O	O	O
散热片( ) Heatsinks	O	O	O	O	O	O
风扇 Fan	O	O	O	O	O	O
光盘说明书 CD Manual	O	O	O	O	O	O
正面(前)面板 Front panel	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下.
O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求.
X: Indicates that this toxic or hazardous substance contained in at least one of the

homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

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CHANGE HISTORY

Rev	Date	ECP #	Description	Approved By
00	6/7/13	606947	User's Guide	GKOU
01	7/29/13	608395	User's Guide	MYRA

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1 Introduction

The MATRIXPRO-II DVI 16x16 router enables users to switch up to 16 different DVI sources to 16 different digital displays. Any input source, whether it's a HD-DVD player, Blue-Ray player or a computer with high-resolution graphics, can be routed to a DVI or HDMI (via an adaptor) output digital display.

The unit is fully compliant with the HDCP digital copy protection interface.

1.1 Key Features

- 16 DVI inputs and outputs
- DDC/HDCP compliant
- Supports up to WUXGA (1920x1200) at 60Hz refresh rate
- Supports 3 types of EDID management:
  - Default Mode
  - Auto Mix Mode
  - Output Copy Mode
- Supports various control methods:
  - Front panel button operation
  - Command input (Through RS-232 and Telnet connections)
  - Built in web panel control (TCP/IP)
  - PC program by RS-232 and UDP
- Supports entire family of Barco Encore Controllers
- Dual hot-swappable power supplies for power redundancy and load sharing *(Redundant supply is optional, Barco part number R767420K)*
- Diagnostic function for quick troubleshooting
- Video generator output and input monitoring port for easy installation

1.2 Shipping

- MATRIXPRO-II DVI 16X16, Router (p/n R9004691): 1 EA
- AC power cord US: 1 EA
- AC power cord EU: 1 EA
- Quick Start Guide (QSG) : 1 EA
- Customer Registration Card: 1 EA
- Firmware download cable (RJ11 to DB9): 1 EA
- RS-232 cable (Straight type): 1 EA
- CD containing:
  - User's Guide
  - Quick Start Guide
  - PC (GUI) Software
  - Router Firmware
  - Megaboot.exe
  - EDID Editor

1.3 Notice Of Safe Usage

We recommend you to read following warnings, precautions and information before operating the unit.

- Use of the equipment in a manner not specified by the manufacturer may result in irrecoverable damage
- Keep the unit away from liquid, magnetic and combustible substances
- Do not place heavy weight on the unit
- Do not install the unit in a hazardous location (i.e., high vibration or impact risk)
- Do not install the unit vertically
- Do not disassemble the unit

- To turn the unit off completely, unplug the AC power cords
- The switch on the front panel is only a reset switch

1.4 Physical Description

The MATRIXPRO-II DVI 16 X 16 router chassis is mountable on a 19” standard rack. Key buttons, LCD display and reset switch are on the front panel as shown below.

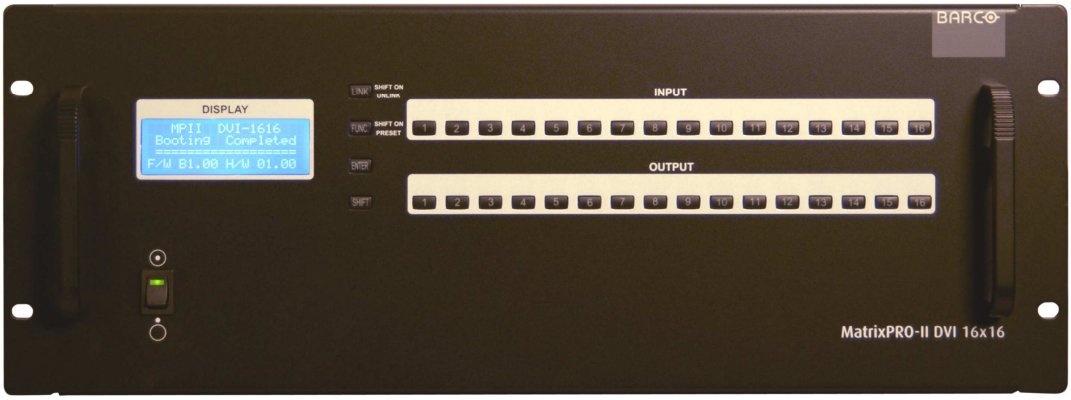


Figure 1-1: Front panel of MATRIXPRO-II DVI 16 X 16

All Input and output cards, interface ports and power supplies are placed on the rear panel as shown below.

- **Input bay** for 4 input cards (left side)
- **Output bay** for 4 output cards (right side)
- **SERVICE**, RJ-11 receptacle for firmware upgrades
- **RS-232**, Serial communication port
- **LAN**, RJ-45 receptacle for TCP/IP or UDP control
- **REFERENCE OUTPUT** provides an internal test pattern video source
- **MONITORING OUTPUT** provides an additional output to monitor input signals
- **Power supplies** *(second power supply is optional, Barco p/n R767420K)*

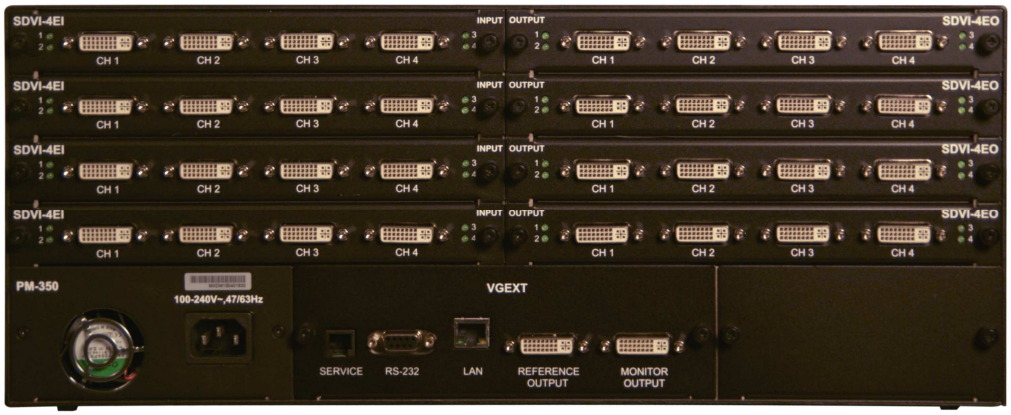


Figure 1-2: Rear panel of MATRIXPRO-II DVI 16 X 16

2 Installation

2.1 Initialization

- Connect the provided AC power cord to AC power inlet and turn on the front panel switch
- The unit starts the initialization process. The message "Starting" will be shown on the LCD display.
- After 17~20 sec, 'MATRIXPRO-II DVI 16x16 Booting complete' message will be shown, along with hardware and firmware version information.
- The unit is now ready to receive commands from the user.

Typically, the IP address of PC connected to the network is configured by a DHCP server. If the PC is connected directly to the router, the network server will not able to assign the IP address. In this case, network information for the PC should be set manually.

The default IP address of MATRIXPRO-II DVI 16x16 is 192.168.0.246. Before connecting MATRIXPRO-II DVI 16x16 to your network, please verify the availability of IP address in your network. The IP address can be reconfigured by front panel key button, PC program or command lines over RS-232 or TCP/IP.

2.2 EDID Configuration

- EDID (Extended Display Identification Data) is an information set that is provided by a display to describe its capabilities to a graphic source. It enables a graphic source to identify the connected display.
- The information set includes: manufacturer, product type, phosphor or filter type, timings supported by the display, display size, luminance data and (for digital displays only) pixel mapping data.
- Once the graphic source reads the information set (usually during the booting process), the EDID conveys the optimal format for a connected display.
- The MATRIXPRO-II DVI supports storing EDID information to an EEPROM for each Input.
- The MATRIXPRO-II DVI has three methods to set EDID values
    1) Default Mode: default EDID information from the factory is loaded to an input port
    2) Output Copy Mode: read EDID from any target display and copy to an input port

3) Auto Mix Mode: (The most advanced method) read all EDID information from the attached input devices. An information set optimized for all inputs is created and used to avoid any compliance problems in the field.

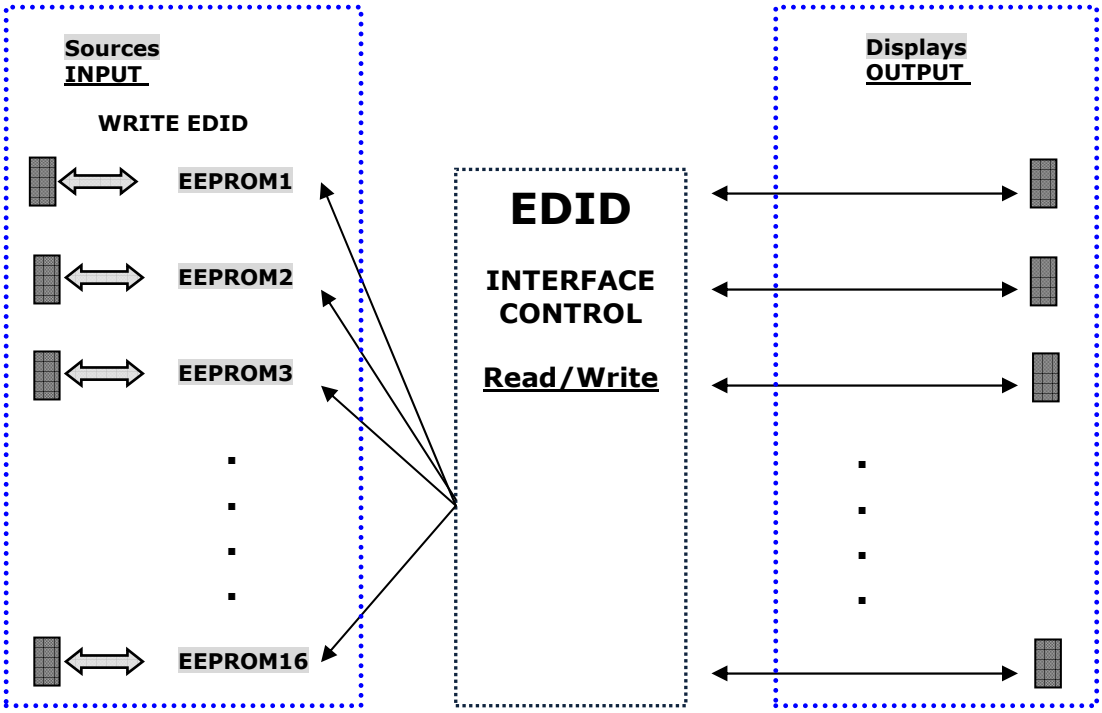


Figure 2-1: EDID operation

As depicted in the Figure, once the EDID is configured, each EDID is stored in EEPROM in Input ports. As a result, the video sources can read the EDID information from the EEPROM during booting process.

The router's default EDID resolution is 1280x1024 @ 60 Hz

3 Control Setup

The MATRIXPRO-II DVI 16x16 router can be controlled in various ways such as command input (RS-232, TCP/IP), Web GUI control panel (TCP/IP), Windows application (RS-232, UDP) as well as key button on the front panel. To use a PC for control, the PC must be configured properly.

3.1 TCP/IP

TCP/IP, the abbreviation of Transmission Control Protocol (TCP) and the Internet Protocol (IP) is commonly used protocol to control remote computers.

To control MATRIXPRO-II DVI 16x16 over TCP/IP, set network properties of PC as below (Explained here is based on Win 7 OS).

- Open Control Panel.
- Select Network Status in Network and Internet menu.
- Select Adapter setting.
- Select Local Area Connection and right click to open property.
- Select Internet Protocol Version 4 (TCP/IPv4)
- Enter IP, Subnet mask, Gateway and DNS server address, compatible with the current network setting of MATRIXPRO-II DVI 16x16
- Click OK to terminate IP setup session.

The router's default IP address is 192.168.0.246
Set the PC's IP address in the same range as the routers address:
192.168.001.nnn; where 'nnn' is not conflicting with other devices on the network

3.1.1 Launching Telnet

Telnet is a terminal program embedded in Window OS system to access remote computers using TCP/IP protocol. With the network setting of the PC as above, launch Telnet as below.

- Make sure that the PC and the router are connected by Ethernet.
- Click Start menu and select Run.
- Type CMD to open command window.
- Type 'telnet 192.168.0.246' (Type current IP address of the router)
- Press **ENTER** then, "==Welcome to MATRIXPRO-II DVI 16x16 ==" and "== TELNET control ==" messages will be shown.
- Type the command to control the router

3.2 RS-232

3.2.1 Launching HyperTerminal

The MATRIXPRO-II router provides RS-232 serial communication. The simplest way to control the router over RS-232 is using embedded Windows XP HyperTerminal program.

> Hyper Terminal is only supported by Windows XP. To install and use Windows XP Mode in Windows 7 please refer to the Microsoft Windows web site
>
> Alternatively, you can download and use the open source Putty terminal software.

To launch Hyper Terminal

- Connect the PC to the unit with a RS-232 cable.
- Select Start > Programs > Accessories > Communications > HyperTerminal.
- Enter a name and choose an icon in Connection Description window and click OK.
- In Connect To window, ignore the Country, Area Code and Phone Number fields but select available COM port of PC and then click OK.
- In COM Properties window, set the parameters as below:

  · Bits per second (baud rate): 115200 (115200 is default baud rate of MATRIXPRO-II DVI 16x16)
  · Data bits: 8
  · Parity: None
  · Stop bits: 1
  · Flow control: None

> Bit per second of Hyper Terminal should be set as same as baud rate of MATRIXPRO-II

- Click OK to save the parameters.
  - Go Start > Programs > Accessories > Communications > HyperTerminal, then new icon will be shown. Then select it to launch Hyper Terminal
  - Type the command to control the unit

4 Front Panel Operation

4.1 LINK mode

- It configures input / output connections for cross-switching.

1) Press LINK key button.
2) Press an input key button - LCD will display current connected output.
3) Press single or multiple output key buttons to select desired outputs.
4) Outputs can be deselected by pressing the output key button again.
5) Press ENTER key button to save the configuration.
6) To configure next Input / output connection, repeat steps 1 to 5.

4.2 UNLINK mode

- It unlinks input /output connection.

1) Press LINK key button.
2) Press SHIFT key button. "UnLINK" should now be displayed.
3) Press the input key button for the routing you would like to clear.
4) Press ENTER key button.

4.3 PRESET mode ("SHIFT ON PRESET")

- The Preset function is currently unavailable. This feature will be added in the future.

4.4 FUNCTION mode

- This function enables the configuration of the unit allowing it to be controlled by commands input or from the PC windows program
- By pressing the FUNCTION button, the menu on the front panel display will cycle through the following features:

1. Gateway
2. Subnet Mask
3. IP Address
4. Mac Address
5. UDP Port Number
6. Video Generator
7. Monitoring Output
8. EDID Configure
9. HDCP Configure
10. Baud Rate
11. Control Lock
12. Reset Mode

4.4.1 Gateway

- The cursor shows that it is selected and activated.
- Input 3 key button decreases the number.
- Input 4 key button increases the number.
- Input 1 and 2 key buttons move the cursor left and right.

======Gate Way======
O: 192. 168. 000. 001
N: 192. 168. 000. 001

- Modify the Gate way address to be used for your network.
- Press ENTER key button to complete the process.
- The default setting is 192.168.000.001

4.4.2 Subnet Mask

- The cursor shows that it is selected and activated.
- Input 3 key button decreases the number.
- Input 4 key button increases the number.
- Input 1 and 2 key buttons move the cursor left and right.

====Subnet Mask====
O: 255. 255. 255. 000
N: 255. 255. 255. 000

- Modify the Subnet mask address to be used for your network.
- Press ENTER key button to complete the process.
- The default setting is 255.255.255.000.

4.4.3 IP Address

- The cursor shows that it is selected and activated.
- Input 3 key button decreases the number.
- Input 4 key button increases the number.
- Input 1 and 2 key buttons move the cursor left and right.

=====IP Address=====
O: 192. 168. 0. 246
N: 192. 168. 0. 246

- Modify the IP address to be used for your network.

- Press ENTER key button to complete the process.
- The default setting is 192.168.0.246

4.4.4 MAC Address

- MAC Address of the unit is displayed. This is a fixed value and cannot be changed.

4.4.5 UDP Port Number

- This will display the UDP port number.
- The default UDP port number is 03000. The UDP port number cannot be changed using the front panel keys.

Port number setting in this section is used for UDP with supplied PC program not TCP/IP with web browser or Telnet. For TCP/IP, port number 23 is fixed value.

.

4.4.6 Video Generator

- The Video Generator (Reference Output) is set at 1280x1024@60Hz with a Vertical Bar pattern. This output cannot be changed.

4.4.7 Monitoring Output

- It allocates input to Monitor Output port for monitoring uses.
- The cursor shows that it is selected and activated.
- Input 3 key button decreases the number.
- Input 4 key button increases the number.

=Monitoring Output=
Old Input: 01
New Input: 01

1) Connect a display to the Monitoring Output port and any video sources to the DVI input ports on the real panel.
2) Select an input port by pressing input 3 or 4 key button.
3) Press ENTER key button to complete the process.

4.4.8 EDID Configure

- Sets the EDID information in input port.
- MATRIXPRO-II DVI 16x16 supports three types of EDID setting: Default Mode, Auto Mix Mode and Output Copy Mode. For more information, refer to Chap. 5.2.
- The cursor shows that it is selected and activated.
- Input 1 and 2 key buttons select YES and NO.
- Input 3 and 4 key buttons move left and right (Change EDID mode).
- Input 5 and 6 key buttons move down and up (Decrease and increase the port number).

===EDID Configure===
Entry EDID
Configure? _1: Entry

1) Press input 1 key button to enter the EDID Configure Mode.

===EDID Configure===
Input: 01 Default
Default Mode?
1: Y 2: N 3: << 4: >> 5: ∨ 6: ∧

The EDID configuration that is shown next to the input number on the LCD display is the current EDID mode

2) Select an input port by pressing input 5 or 6 key button.
3) Press input 3 or 4 key button to change EDID mode.
   3-1) If you select **Default Mode**, default EDID will be restored for allocated inputs.
   ===EDID Configure===
   Input: 01 Default
   Default Mode?
   1: Y 2: N 3: << 4: >> 5: ∨ 6: ∧

   Press input 1 key button then, the MATRIXPRO-II DVI 16x16 will recover the Default EDID to allocated input as below.

   ===EDID Configure===
   EDID Copying….
   EDID Reading….
   3-2) If you select **Auto Mix Mode**, mixed EDID of all attached displays will be saved in allocated input.

   3-3) If you select **Output Copy Mode**, MATRIXPRO-II DVI 16x16 reads EDID from any target displays and copies it in allocated input.

New EDID can be created or existing EDID can be modified using the Edit Data Mode. This feature is recommended for advanced users only.

- Improper EDID setting can compromise the stability of the system
- Not all computer graphics cards will be able to output a custom EDID resolution.
- Be sure that you fully understand this feature prior to use.

For further information, please contact folsomsupport@barco.com

4.4.9 HDCP Configure

Disabling HDCP Compatibility

By default, the MATRIXPRO-II DVI 16X16 is an HDCP compatible Video Router. HDCP protected content received on a DVI input connector from an input source such as a Blu-ray player is processed and output on the DVI output connector(s) to an HDCP compliant display device.

Occasionally, an input source which is supplying video which is not meant to be protected may add HDCP protection to the content solely because it has detected that the MATRIXPRO-II DVI 16x16 is capable of processing HDCP protected content. In this case, if HDCP compatible display devices are not used, this content can not be processed and output by the MATRIXPRO-II DVI Router, and the content can not be displayed. This has occurred at times when outputting content from an Apple MacBook Pro via a mini-DisplayPort to a DVI-adapter.

In order to allow the use of sources such as the MacBook Pro to display non-HDCP protected data (for example, the show graphics) with standard non-HDCP compliant displays, we have added the ability to disable HDCP compatibility in the MATRIXPRO-II DVI 16x16 Router. Please note that this new feature DOES NOT allow output of HDCP protected content to non-HDCP compliant devices. It simply allows the user to force the MATRIXPRO-II DVI to behave as a non-HDCP compatible device.

HDCP CONFIGURE

- Allows you to turn the HDCP On or Off for any of the Inputs
- Input 1 and 2 key buttons select the Input number
- Input 3 and 4 key select HDCP On or Off

===HDCP Configure===
Input: 01
HDCP Compatible ON
1: ∨ 2: ∧ 3:ON 4:OFF
Select the Input using the Input 1 and 2 keys
To turn "ON" HDCP press the Input 3 key and to turn "OFF" HDCP press the 4 key
Press ENTER key to complete the process

Note: The MATRIXPRO-II DVI 16x16 Router will return to HDCP ON for all inputs after a "Factory Reset"

4.4.10 Baud Rate

- Sets the RS-232 Baud Rate. MATRIXPRO-II DVI 16x16 supports 9600, 19200, 38400, 57600, 115200bps.

=====Baud rate=====
Old baud: 115200
New baud: 115200

- Input 3 key button decreases the number.
- Input 4 key button increases the number.
- Press ENTER key button to complete the process.
- The default setting is 115200

4.4.11 Control Lock

- Locks and unlocks the controls such as Web, RS-232, TCP/IP, UDP and key button

====Control Lock====
Web Lock? UnLock
Data Lock? UnLock
Key Lock? UnLock

- Input 1 and 2 key buttons move the cursor up and down.
- Input 3 key button moves Lock.
- Input 4 key button moves UnLock.
- Press ENTER key button to complete the process.

4.4.12 Reset Mode

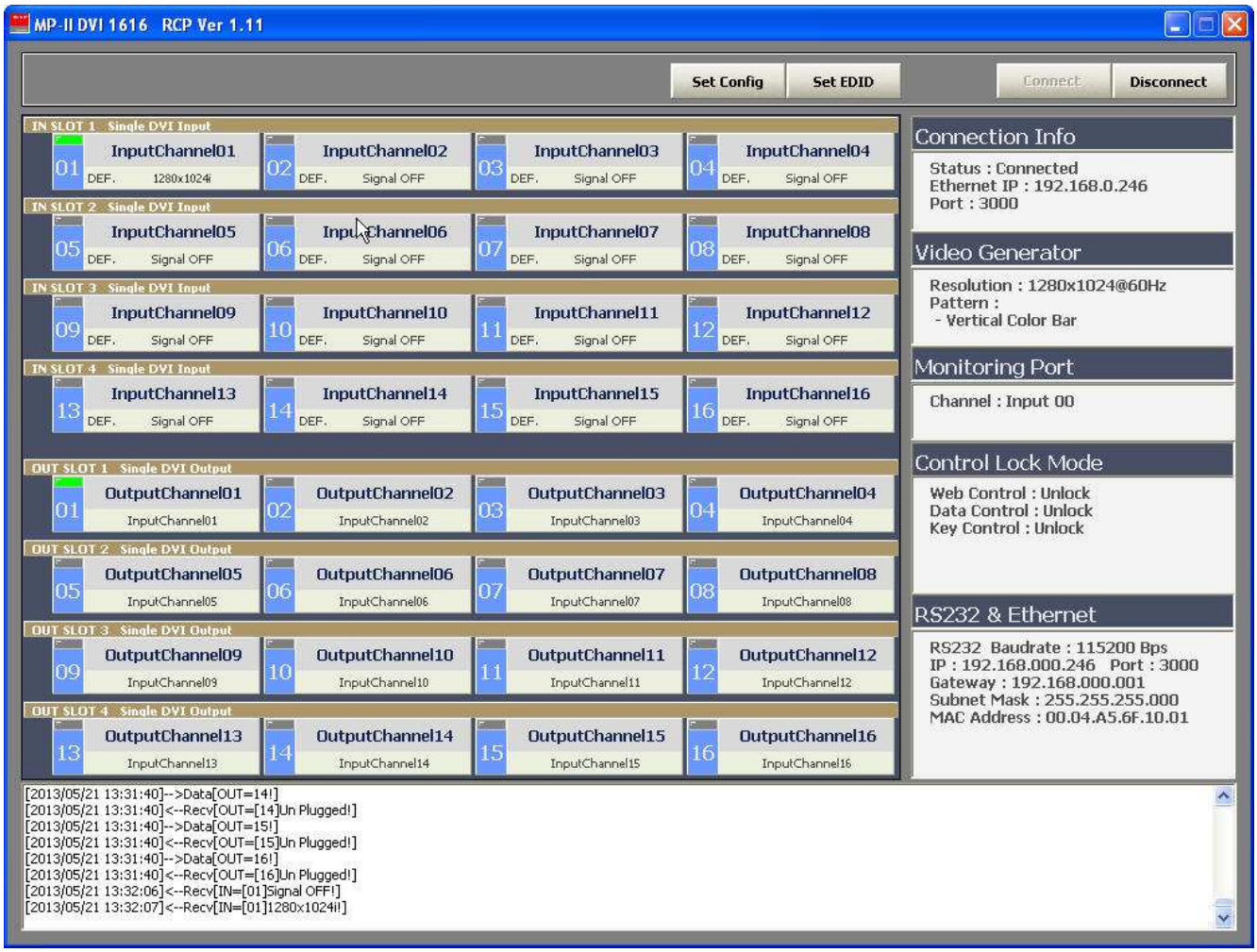
- Resets the unit. After reboot it will restore all default settings.
- Input 1 and 2 key buttons select YES and NO.
- Press ENTER key button to complete the process.

5 PC Program Operation

Run the setup.exe to install MATRIXPRO-II DVI 16x16 PC program. The Barco icon will be shown on the wallpaper. Double click it to launch PC program for MATRIXPRO-II DVI 16x16.

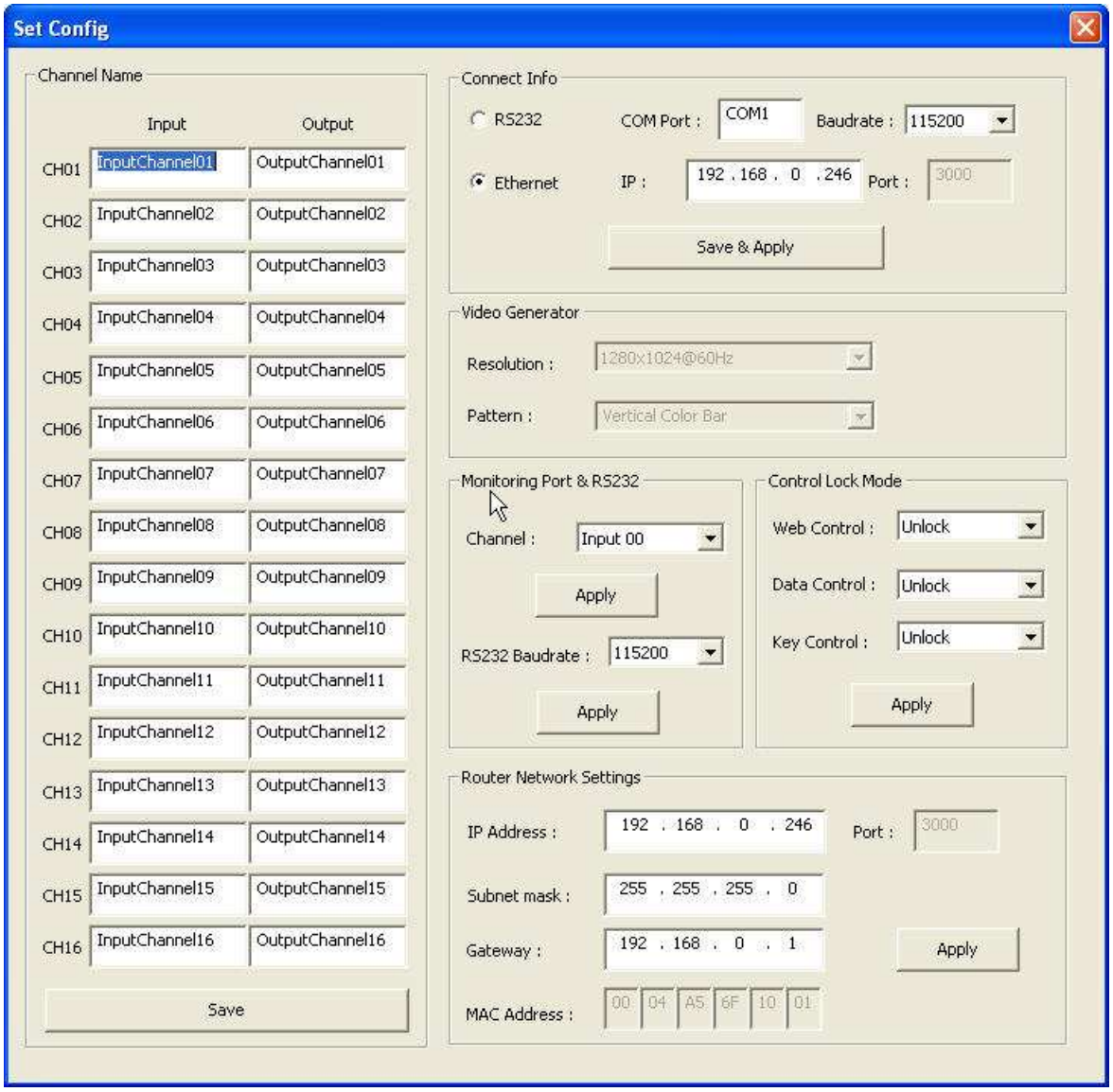
The PC program provides a user-friendly graphic interface alternative to key button input and command input operation.

Copy MPII-DVIsetup.exe file in any directories in your PC and double click it to run. The initial window of PC program for MATRIXPRO-II DVI 16x16 as shown below will appear.



5.1 Basic Setup

Click **Set Config** button to set the communication method, input / output name, Video generator and so on. Then, the Set Config window as below will open.



5.1.1 Connect Info

- Select the connection method to be either RS-232 and Ethernet (UDP) by clicking the corresponding radio buttons
- For RS-232 control, enter the COM port number of your PC and select baud rate. The baud rate of your PC should be the same as the MATRIXPRO-II DVI 16x16 baud rate. (115200 is default)
- For Ethernet control, enter the IP address of the MATRIXPRO-II DVI 16x16 and port number. 3000 is the default port number for the MATRIXPRO-II DVI 16x16.
- Click save button and close Set Config window then click **Connect** button on PC program of MATRIXPRO-II DVI 16x16 to start it.
- If the connection is properly made, current status of MATRIXPRO-II DVI 16x16 will be shown at the bottom side of PC program.

5.1.2 Channel Name

- User can create specific names for all inputs and outputs to distinguish them
- On Fig 4.2, The name of **Camera #1** was assigned to Input CH05 and **Wall display #3** for output CH07.
- Click Save button to save it then, these will be applied on the PC program as shown in Fig 4-1.

5.1.3 Video Generator

- Select the resolution and pattern of video generator.
- Click Apply button to save it.

5.1.4 Control Lock Mode

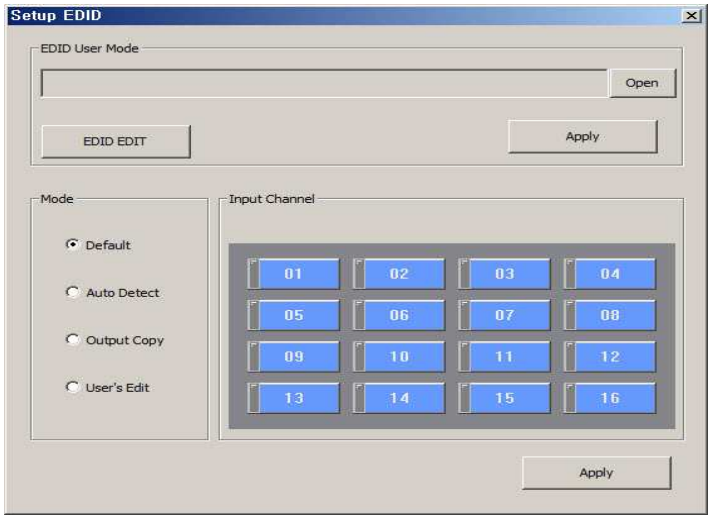
- Locks and unlocks the controls such as Web, Data control (RS-232, TCP/IP and UDP) and key button input.
- Click Apply button to save it.

5.1.5 Network

- Changes the network information of MATRIXPRO-II DVI 16x16 .
- Click Apply button to save it.

5.2 EDID setup

MATRIXPRO-II DVI 16x16 offers 3 types of EDID settings for easy installation with various displays in the market. To set the EDID option for each input port, click **Set EDID** button. The Setup EDID window will open.



To set EDID information for each input, select the appropriate MODE button and click the input channel. For each mode, multi-input channels can be selected the same time.

- **Default** mode is the default EDID as set the factory. Selecting this mode will restore the default EDID on the selected input channels.
- **Auto Mix** mode is an advanced EDID mode. In the mode the unit reads all EDID of attached displays and creates and custom input EDID.
- **Output Copy** mode reads the EDID from any selected output channel and copies it into an input port. Select the output channel first and then click the input channels. Click the Apply button to save settings.
- **Edit Data Mode** is used to modify existing EDIDs or to make a new custom EDID. This feature is recommended for advanced users only.

Improper EDID setting can compromise the stability of the system. Not all computer graphics cards will be able to output a custom EDID resolution. Be sure you fully understand this feature prior to use.

For further information, please contact folsomsupport@barco.com

5.3 Operation

The communication settings and system status are on the right side of the control application as shown below. After clicking the **Connect** button (Refer to Chap. 4.1.1), the MatrixPRO-II DVI is ready to receive commands from user.

The left side of the control application shows the signal connection, resolution, EDID, and routing status of the inputs and outputs.

5.3.1 Input / output connection

- Click on one of the input channels and click on any of the output channels. If you click on input CH05 (Camera #1) and click on outputs CH05, CH06, CH07 and CH08, the input signal from CH05 will be connected to outputs 05, 06, 07 and 08 as shown in Fig 4-5.
- To connect one input to all outputs, click **All Link** button and click desired input. Then all of the outputs will be connected to the selected input.
- To disconnect all outputs, click the **Link Clear** button.

5.3.2 Input channel status

- Green LEDs above the input channel numbers indicate that a signal has been detected. In fig 4-5 above, CH05 and CH10 have detected signals.
- When a signal has been detected, the resolution will also be displayed beneath the channel name (ex. CH05=1920x1080p).
- If no signal is detected the input will display 'Signal OFF'.
- DEF., AUTO, OUT. and USER, indicate the current EDID mode assigned to that input channel (Refer to Chap. 4.2)

5.3.3 Output channel status

- Green LEDs above the output channel number indicate Hot Plug Detection (HPD) from display. For example CH07 is connected to a display.
- The connected outputs show input source information (ex. CH07=Camera #1, input CH05).
- The disconnected outputs show 'No Link'.

6 Web control panel operation

The Web control panel operation provides a user-friendly graphic interface and easy access to control the MATRIXPRO-II DVI 16x16. Some functions available from the PC GUI and front panel are not available from the Web control panel.

- Microsoft Explorer is the recommended browser to run the Web control panel.
- Before running the web, confirm the Network setting of MATRIXPRO-II DVI 16x16 and Ethernet connection of the PC (Refer to Chap 2 and Chap 3).

Launch the web browser and enter the IP address of current MATRIXPRO-II DVI 16x16 into the URL address line. For example, 192.168.0.246

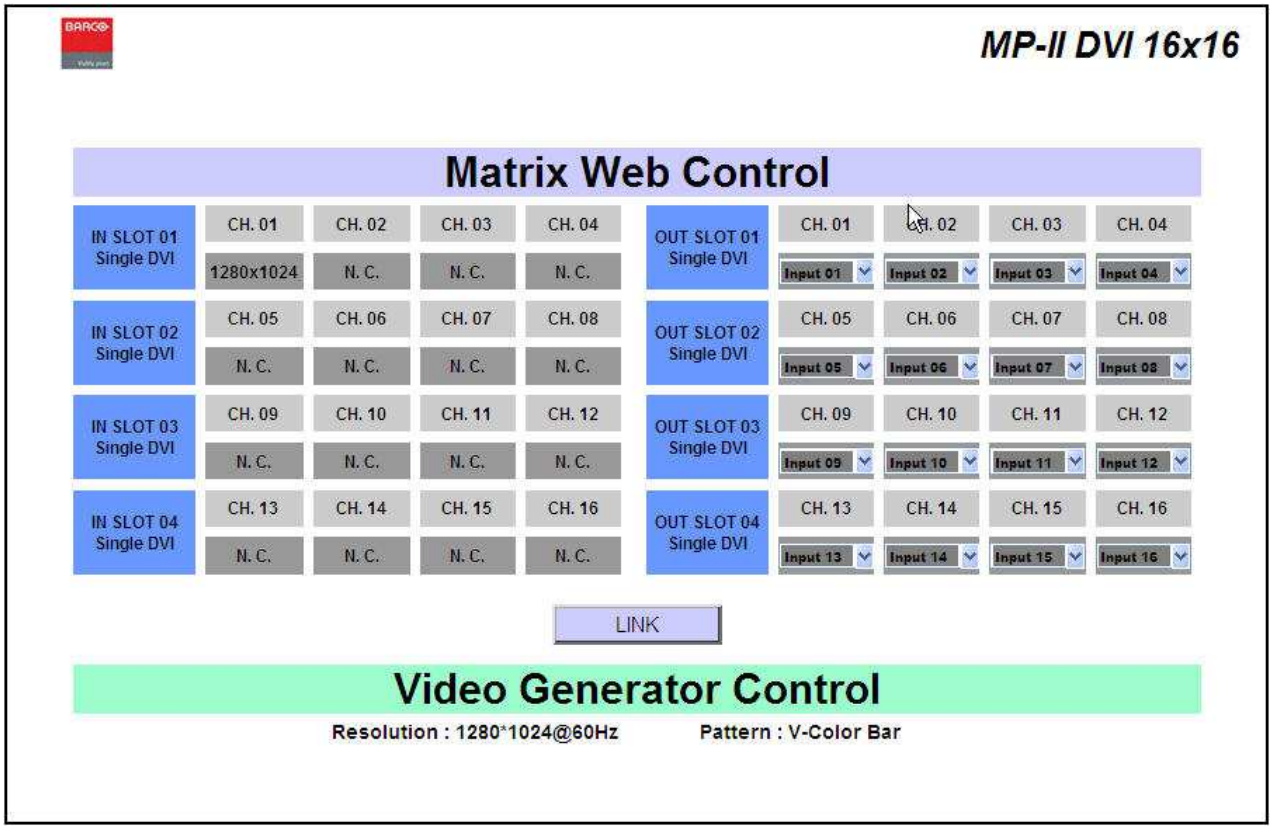


Fig 6-1 shows structure of Web control panel. It controls input / output connection, video generator and informs simple input / output status. Reminder, after new input /output connection, user has to click **LINK** button and **SEND** button for new generator setting.

7 Commands

The MATRIXPRO-II DVI 16x16 router can be operated with various interfaces such as key button inputs, command input through RS-232 and TCP/IP, Web control through TCP/IP and PC program through RS-232 and UDP. All functions are executed on a basis of a serial command input, but the graphic interfaces on the Web or the PC program are more efficient ways to operate the MATRIXPRO-II DVI 16x16 modular matrix.

Command input operation is accomplished through RS-232 or TCP/IP. For setting procedures using those protocols, please refer to Chap 2 and Chap 3.

7.1 Command input structure

The command inputs are composed of a string of ASCII codes and its basic structure is;

Command + Delimiter (‘=’) + Data + Delimiter (‘^’ or ‘,’ or ‘_’) + Data + End (‘!’)

Table 6.1 shows all commands and its brief descriptions

Command	Description
LINK	Input and Output connection
IN	Input signal status request
OUT	Output signal status request
NET	Network information request
NETGW	Gateway address setting
NETSN	Subnet mask address setting
NETIP	IP address setting
NETPA	MAC address setting
NETPT	UDP port number setting
VID	Video generator status request
MON	Monitoring port setting and status request
EDID	EDID mode setting
HDCP	Enable/Disable HDCP
RS232	RS-232 Baud rate setting
LOCK	Lock/Unlock the control type

Table 7-1 : Commands set

- The command input allows executing only one command. Multiple command inputs require executing multiple strings having each command per a string.
- User can use capital letters and small letters for commands but cannot mix it like ‘Link’, it must be corrected as ‘link’ or ‘LINK’.

- After all input commands, MATRIXPRO-II DVI 16x16 sends back replies to conform the execution of commands.
- Input and output port number range from 1 to 16 and prefix, '0' can be used such as '001' and '010, but in the replies after the command inputs, the digits of port number are two such as '01' and '10'.

7.2 Examples of command inputs

7.2.1 Link input and output

- Makes single or multi-connections of inputs and outputs.
- Makes disconnection of all inputs when used with '0'.
- Requests inputs and outputs status of MATRIXPRO-II DVI 16x16.

Command	Description and reply
LINK=01^10!	Makes input 1 connected to output 10. Reply: LINK=01^10!
LINK =1^03,04^7!	Makes input 1 connected to output 3 and 4 to 7. Reply: LINK =01^03,04^07!
LINK =05!	Makes input 5 connected to all outputs. Reply: LINK=05!
LINK =00!	Makes all connections disconnected. Reply: LINK =00!
LINK =00^06!	Makes output 6 disconnected. Reply: LINK =00^06!
Link=?!	Requests current inputs and outputs connections status. Reply: LINK =01^01,02^04,~16^13!

Table 7-2: Link command examples

7.2.2 Input and output status

- Requests input signal status. If the input is connected, it replies input resolution, but if it is not connected, it returns 'Signal Off'.
- Requests output status whether it is connected to display or not.

Command	Description and reply
IN=05!	Requests input 5 status. Reply: IN=[05] 1920x1200p! or IN=[05] Signal Off!
OUT=12!	Requests output 12 status. Reply: OUT=[12] Un Plugged! or OUT=[12] Plugged!

Table 7-3: Input and output status command examples

7.2.3 Network setting

- Sets the IP, Gateway, Subnet mask, MAC address and UDP port number.
- Requests current network setting.

Command	Description and reply
NETGW=192.168.1.1!	Sets Gateway address, each data ranges from 000 to 255. Reply: NETGW=192.168.001.001!
NETIP=192.168.1.118!	Sets IP address, each data ranges from 000 to 255. Reply: NETGW=192.168.001.118!
NETSN=255.255.255.0!	Sets Subnet mask address, each data ranges from 000 to 255. Reply: NETSN=255.255.255.000!
NETPA=AA.BB.CC.DD.EE.FF!	Sets MAC address, each data ranges from 00 to FF. Reply: NETPA= AA.BB.CC.DD.EE.FF!
NETPT=3000!	Sets UDP port number, data ranges from 0 to 65535. NETPT=3000!
NET=?!	Requests current network setting. Reply: NETGW=192.168.001.001! NETIP=192.168.001.118! NETSN=255.255.255.000! NETPA=AA.BB.CC.DD.EE.FF! NETPT=3000!

Table 7-4 : Network setting command examples

7.2.4 Monitor output port setting

- Makes an input connected to the Monitor Output port.
- Requests input port that is currently connected to the Monitor Output port.

Command	Description and reply
MON=13!	Makes input 13 connected to monitor output ports. Reply: MON=13!
MON=?!	Requests current input port that connected to monitor output port. Reply: MON=13!

Table 7-5: Monitor output setting command examples

7.2.5 EDID control command

- It stores EDID information in input port of MATRIXPRO-II DVI 16x16 .
- It requests current EDID setting for all input ports.

Command	Description and reply
EDID=DE1,7,15!	Default mode: Saves default EDID in input ports 1, 7 and 15. Reply: EDID=01DEF.! EDID=07DEF.! EDID=15DEF.!
EDID=AUTO2,8,9!	Auto mix mode: Analyzes all EDID information of connected displays to makes optimized EDID then save it in input ports 2, 8 and 9. Reply: EDID=02AUTO! EDID=08AUTO! EDID=09AUTO!
EDID=OUT3_5!	Output copy mode: Copies EDID information of output 3 display and stores it in input port 5. Reply: EDID=03OUT.!
EDID=?!	Requests current EDID setting for all inputs. Reply: EDID=01OUT.02AUTO03OUT.~16EDF.!

Table 7-6: Monitor output setting command examples

7.2.6 HDCP Setting

- Allows the user to turn HDCP On or Off for any of the 16 input ports.

Command	Description and reply
HDCP=?!	Retrieves HDCP setting for all Inputs Reply: HDCP=01OFF,02ON,03ON,04ON,05ON,06OFF, 07ON,08ON,09ON,10OFF,11ON,12OFF,13ON,14ON,15ON,16ON!
HDCP=9OFF!	Sets HDCP for Input 9 to OFF Reply: HDCP=[09]OFF!
HDCP=12ON!	Sets HDCP for Input 12 to ON Reply: HDCP=[12]ON!

7.2.7 Baud rate setting for RS-232

- Sets the RS-232 baud rate. MATRIXPRO-II DVI 16x16 supports 9600, 19200, 38400, 57600, 115200bps.
- Requests the current RS-232 baud rate.

Command	Description and reply
RS232=115200!	Sets RS-232 baud rate. Reply: RS232=115200BPS!
RS232=?!	Requests current baud rate. Reply: RS232=115200BPS!

Table 7-7: Baud rate setting command examples

7.2.8 Control lock command

- Locks and unlocks the controls such as Web, RS-232, TCP/IP and UDP.
- Requests open status of controls.

ASCII	Description
WL	Web control lock
WUL	Web control unlock
DL	Data control (UDP, TCP/IP, RS-232) lock
DUL	Data control (UDP, TCP/IP, RS-232) unlock
KL	Key control lock
KUL	Key control unlock

Table 7-9: Locking type and its ASCII data

Command	Description and reply
LOCK=DL!	Locks data control. Reply: LOCK=DL!
LOCK=?!	Request current status of control method. Reply: LOCK=WUL,DUL,KUL!

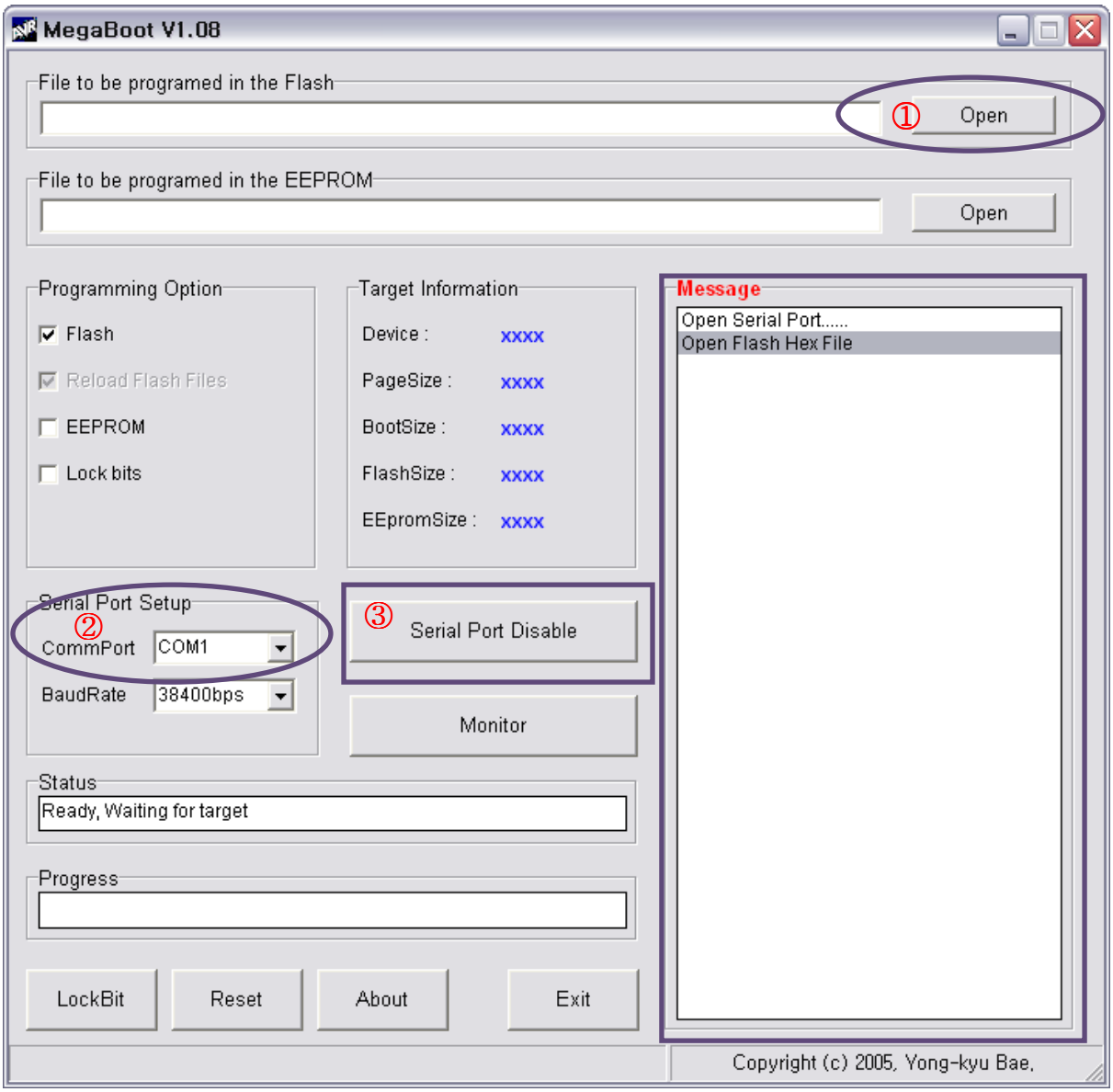
Table 7-10 : Control lock command examples

8 Firmware update

1. Using a Windows XP based PC, install the megaboot.exe program provided on a CD.

> You can run **Megaboot.exe** with Windows 7, as an Administrator.
>
> Alternatively, you can run **Megaboot.exe** under Windows XP.

2. Click ①**,** Open of **'File to be programmed in the Flash'** to select directory and file (hex. Format) to be uploaded.



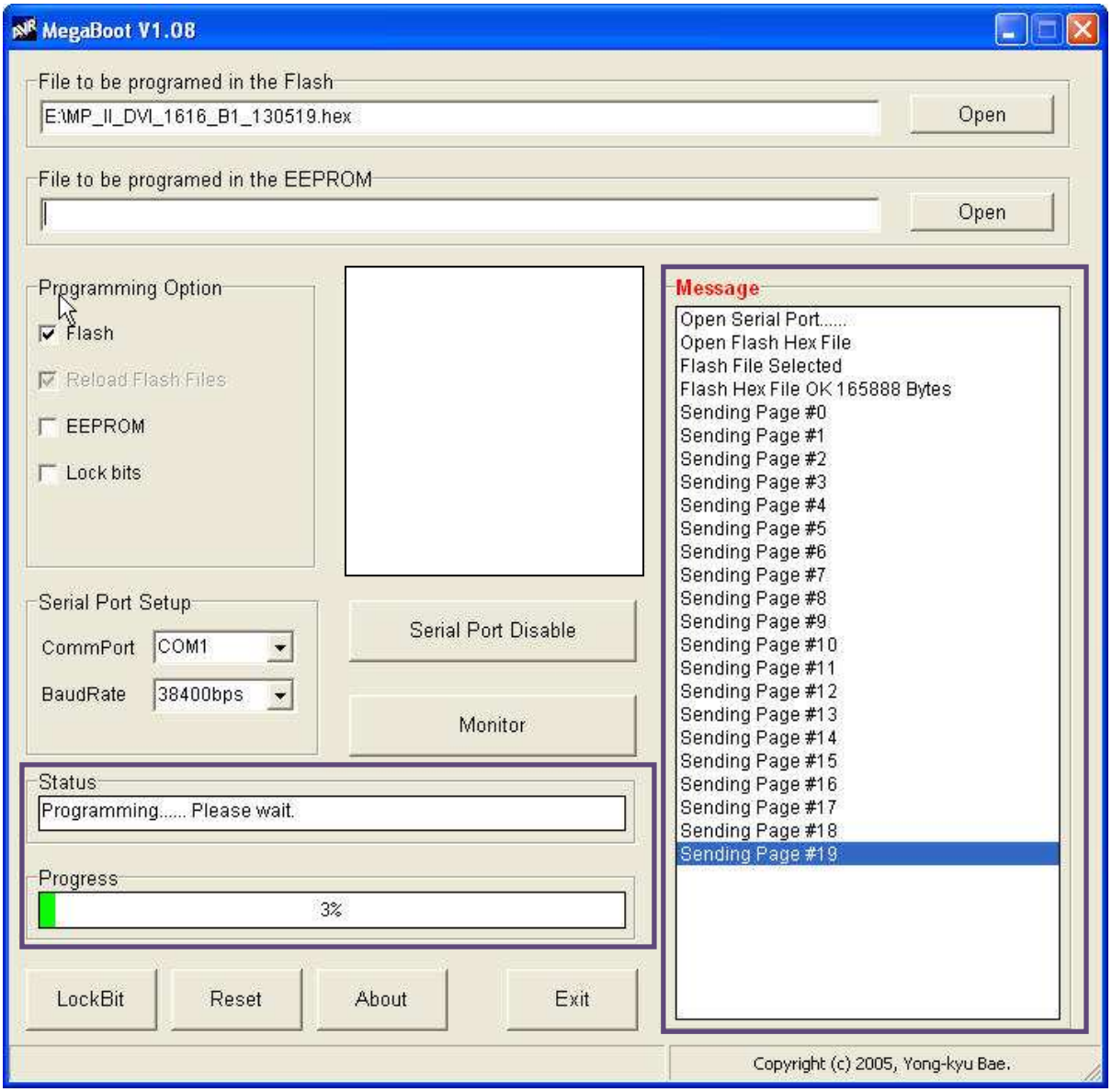
3. Connect the Service Port located on the rear panel of the MATRIXPRO-II DVI 16x 16 to a RS-232 (Comm port) on a PC using the supplied **download cable (RJ1 1 to D-Sub 9Pin cable).**

4. Select ②**, 'Comm port'** to select communication port of PC for RS-232 communication with MATRIXPRO-II DVI 16x16.

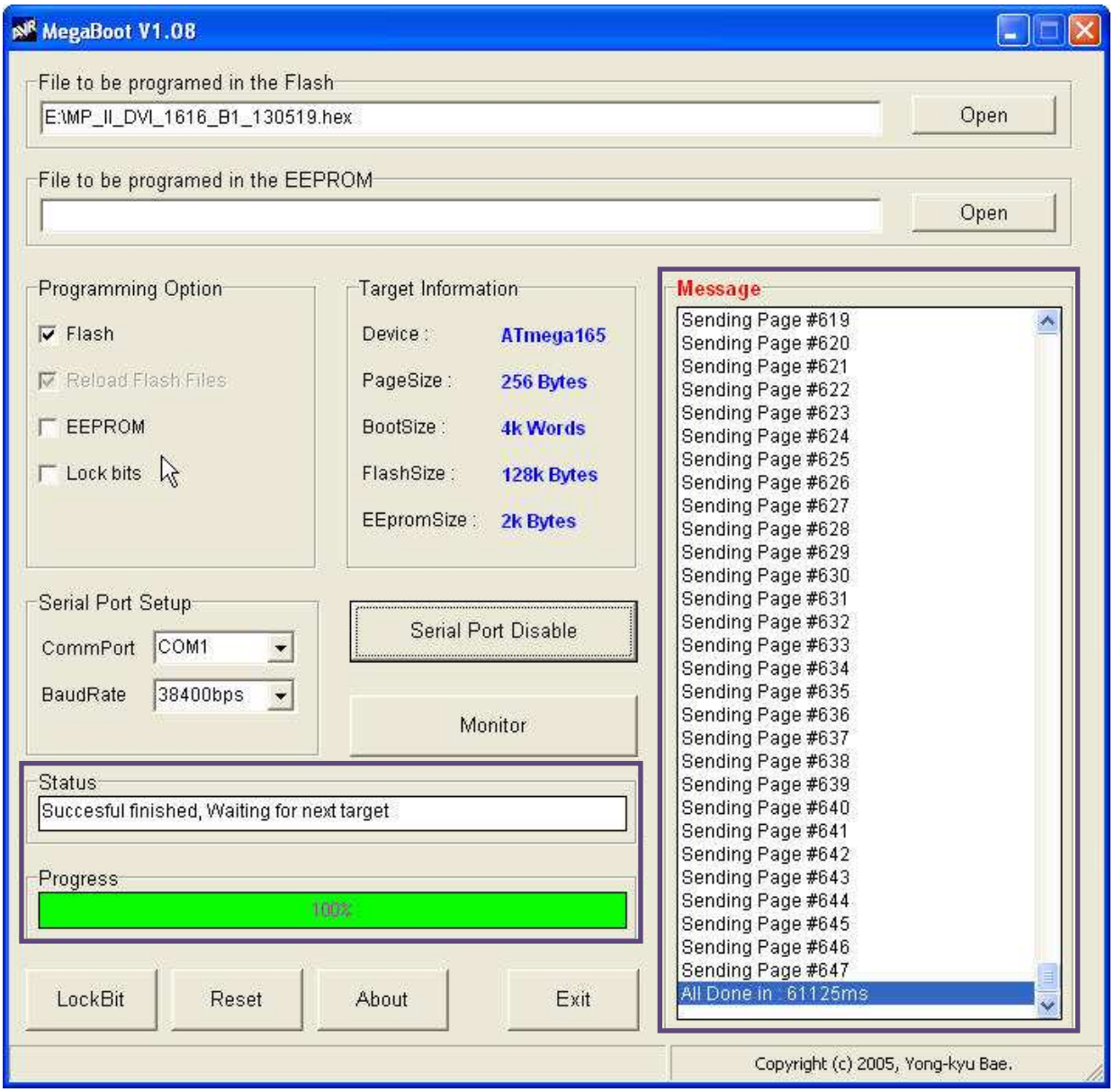
5. To enable Comm port, Click ③ when it shown as 'Serial Port Enable'.

6. **Power-On the MATRIXPRO-II DVI 16x16**.

7. The firmware upload should then begin and the status will be shown in the message box as shown below.



8. After 1 to 2 minutes, and "**All Done**" message will be shown. Then the firmware upload is completed.



9. Close the MegaBoot.exe program and reboot MATRIXPRO-II DVI 16x16 to run it under the new firmware.

9 HDCP notes

HDCP stands for High-Bandwidth Digital Content Protection, an industry-wide copy protection scheme that is used to prevent the potential interception of digital data between the source (e.g., a Blu-Ray player) and the target display (e.g., an HDCP compliant display or monitor). The HDCP format was designed by Intel®, and it uses an "authentication and key exchange" procedure to accomplish the required protection. For proper implementation, products that are compatible with the HDCP format require a secure connection to a compliant display, such as a projector or monitor.

In applications in which the DVI router is used, when an HDCP compliant device is connected to the router, an HDCP "session" is created. In this session (which is transparent to the user), "keys" are exchanged between the source device (e.g., a Blu-Ray player) and the HDCP compliant display.

The source device queries the display to ensure that the equipment is HDCP compliant before video is shown. Non-HDCP equipment such as PCs will work with any DVI compliant display, but HDCP compliant equipment only shows "protected" content on HDCP compliant displays.

10 Specifications

Video INPUTS	
DVI	●All single-link DVI digital formats up to 165 Mhz, per DVI 1.0 specification ● EDID version 1 .3 compatible
Video OUTPUTS	
DVI	Formats: all single-link DVI digital formats up to 165 Mhz, per DVI 1.0 specification
Reference and Monitor	Formats: all single-link DVI digital formats up to 165 Mhz, per DVI 1.0 specification
Physical and Electrical Specifications	
Control	Ethernet RJ-45, 10/100 Mbps autosense
Height	7 in, 178 mm (4RU
Width	17.32 in, 440 mm
Depth	14.96 in, 380 mm
Weight	< 10 kg
Input power	100-240 VAC, 50-60 Hz, 800 watts max. (each supply)
Environmental	Humidity: 0-95% non-condensing
Temperature	0-40° C
Warranty	Full three-year parts and labor warranty

11 Warranty

Warranty

All video products are designed and tested to the highest quality standards and are backed by a full 3-year parts and labor warranty. Warranties are effective upon delivery date to customer and are non-transferable. Barco warranties are only valid to the original purchaser/owner. Warranty related repairs include parts and labor, but do not include faults resulting from user negligence, special modifications, lightning strikes, abuse (drop/crush), and/or other unusual damages.

The customer shall pay shipping charges when unit is returned for repair. Barco will cover shipping charges for return shipments to customers.

Return Material Authorization (RMA)

In the unlikely event that a product is required to return for repair, please call the **Technical Support / Customer Service** direct line, and ask to receive a Return Merchandise Authorization number (RMA).

RMA Conditions are listed below:

a. Prior to returning any item, you must receive a **Return Merchandise Authorization** (RMA) number.
b. All RMA numbers must appear on their return-shipping label.
c. RMA numbers are valid for ten (10) days from issue date.
d. All shipping and insurance charges on all RMAs must be prepaid by the customer

12 Contact Information

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